A TECHNICAL JOURNAL DEVOTED TO FOUNDRY INTERESTS.

THE FOUNDRY

Published Monthly by

"The Foundry Publishing Co."

DETROIT, MICH.

S. E. WHITNEY, President and Treasurer.
JOHN A. PENTON, Editor and Manager.

DETROIT, APRIL, 1895.

Entered at the Post Office at Detroit, Mich., as second-class matter.

SUBSCRIPTION—One Dollar per year in advance in all parts of the United States and Canada; one dollar and fifty cents per year to all parts of the Universal Postal Union. May be sent by express, draft, money order, registered letter or U. S. postage stamps. Single copies, 15c.

CLUB RATES—Eight or more subscriptions sent at one time, 75 cents per year each. Cash to accompany order.

Advertising rates furnished upon application

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THE FOUNDRY is issued promptly on the tenth of each month, and will spare no endeavor to furnish valuable news and information to those interested professionally or incidentally in molding, melting, mixing of metals, foundry management, etc. Persons connected with any of these lines of industry will confer a favor upon the Editor of this Journal by sending him news from their section of the country pertaining to the foundry interests, particularly individual theories and experiences of practical value.

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Is there a man with soul so dead
Who to himself has never said

BUSINESS IS GOOD?

If such a man really does exist the nearest dime museum manager should gather him in at the first opportunity. We do not mean that every line or every manufacturing or industrial enterprise is enjoying a boom, but we do mean that the present revival is in most marked contrast to the fearful business experiences of the past two years.

In the foundry business more new establishments are being contemplated built and more old ones enlarged than at any time during the past eighteen months, while the news of enlargements and purchase of new equipments seems to be steadily on the increase. We know of a very large number of well-known foundries which are as busy as they care to be, and while the margin is small, a continuation of the present improvement will lead to a living profit being secured. The price of pig iron would at last seem to have reached the end of the toboggan slide that it has been slipping down for so many years, and buyers now feel lucky if they can have their wants filled at February prices. The rise in the price of coke and ore has ncreased the cost of production, especially in some grades, while a few other factors that may have something to say in adjusting the price are yet to be heard from, and it seems safe to conclude that orders placed now will not cause any regrets.

The stove shops are running most of them nearly full, and agricultural foundries are in full blast in most sections. Builders of Corliss Engines and improved methods of furnishing power, pumping engines, lathes, planers, drills, shaping machinery, etc., are nearly all quite busy, while makers of water pipe and cotton machinery are both busier than for a long time, caused in the first place by the inauguration of new and enlargement of present water systems, and in the second place by the building of some extensive cotton plants in the South. The molders of the country are rapidly finding employment, and in some localities have actually been in demand. Taken all together, the outlook is more promising than for many years, as the financial troubles through which we have just passed have had a purifying effect, and what is being done is being done carefully.

Two Ways of Doing it.

The Executive Committee of the Iron Molders' Union and the officers of the Stove Manufacturers' National Defense Association met in conference in Chicago on March the 26th and reaffirmed the resolution adopted in New York in January, 1894, as regards the wages to be paid to molders engaged in shops under the jurisdiction of this association and the manner of settling any difference that may arise.

The Foundry feels as if it was an occasion to be viewed with no little pride and satisfaction by every honest manufacturer and well-wisher of the iron molders of the country, and it affords, as well, an object lesson to employers and employees of every description in all portions of it.

During the recent hard times the ruthless competition of manufacturers generally caused many reductions in wages that really benefited no one, but the stove manufacturers have set a truly noble example by coming to an agreement with their molders that prevented any changes in that department at least, and as all paid alike there existed no ground for a reduction by any particular firm.

Incidentally, however, we might remark that this did not debar one concern from endeavoring to get what was really an unfair advantage by cutting the price at which their stoves were sold, and at the same time reducing wages to a point that would more than make up the difference.

The P. D. Beckwith estate, of Dowagiac, Mich., make what is known as the Round Oak stoke, it being almost their sole output, and for several years they put them on the market at prices that were arranged and agreed on by all the makers of Oaks, and which, apparently, were satisfactory. They suddenly, however, decided to go back on former arrangements, and without warning to other manufacturers sent out a circular under date of December 20th, promising a reduction in price, and early in January their traveling men started out to carry this into effect. This coming to the knowledge of the Stove Manufacturers' Association, they called a meeting in Chicago and tried in vain to induce the representative of the company to recall his circular, pointing out that it was a reduction that would only effect the moulder or employee, as all others would meet it.

The moulders' side of this question is told in a very few words. They were reduced 10 per cent in January, 1894, and 10 per cent in January, 1895.

The last cut was more than they could stand, and in order to save other manufacturers from this competition, if possible, they went out on a strike that has continued two months. The shop was closed for several weeks, and is now running a very small force of non-union labor.

The last installment of news from Dowagiac being an account of a $15,000 fire caused by an incendiary doubtless in symjathy with the strikers.

The foregoing contains an account of two different methods of getting along with employees. Which is best?

More Light Needed.

The Western Foundryman's Association devoted the greater portion of their last meeting to a discussion of the subject of "Costs and Cost Sheets," with a view of arriving correctly at and keeping a record of the cost of castings, whether considered collectively or as an individual casting.

While the discussion, for many reasons, was of a very elementary nature, it yet showed the lack of any recognized system or uniform method for arriving at the desired results. A few of those present had methods designed by themselves which seemed to the parties using them to be satisfactory, and while each man was ready to defend his own plan they seemed equally as willing to criticise and point out the weak spots that in their opinion existed in all others. While there can be no doubt that a system that would prove successful in a large agricultural shop, working piece work, would require some little change for a machinery or jobbing foundry. Yet these changes could be effected without altering the general system. If the discussion at this meeting showed any one thing more than another it was the need of a comprehensive, uniform method for use in the foundaries of the country that would enable a comparison of results among foundrymen generally.

Such a system would, of necessity, be somewhat elastic as to details to admit of its

rigid application in all cases, but the results should be accurate, definite and correct. None others are worth the paper they are written on, and to ensure this some detail is a necessity. In this connection we feel like commending the system spoken of by Mr. A. Sorge, Jr.; it certainly has the merit of thoroughness, and the same principle could be utilized in foundries doing almost any kind of work.

Mr. Sorge has evidently given the matter much thought and study, and, as it seems to us, that there is much need at this time for a greater amount of attention to this subject, we sincerely hope that he may be heard from more fully at an early date.

Our Foundry Export Trade.

We are indebted to James P. Gardner, of Cincinnati, for some further information concerning our iron exports to other parts of the world. The value of castings exported from June 30, 1892, to June 30, 1893, was $570,841; from June 30, 1893, to June 30, 1894, $491,926, or a falling off of $78,915. During these two years, however, we exported steam engines and parts of same to the value of $4,823,643; fire engines, $15,903, and sewing machines, $721,720.

These figures are somewhat interesting as showing that in certain lines American products are more popular abroad than perhaps others. For instance, our export trade in engines, and which item also probably includes pumping machinery, etc., is relatively not very large. In fire engines it is almost nothing, while in sewing machines the showing is a trifle more respectable, considering the value of the average machine. To anyone interested, however, in these figures, it will seem that there must be something wrong or the world-wide reputation that the American mechanic and inventor has established for his ingenuity would receive a greater measure of recognition in foreign markets, especially those that are heavy buyers of foreign goods in this line.

The Price of Coke.

Coke has gone up in price and the buyers of coke all know it, while it is doubtful whether they are all agreed as to the cause. It may be a scheme to avoid the usual spring strikes that seem a part of the business, or it may be done for other purposes.

To report all the rumors that fill the air and crowd the columns of the papers would take many pages, and the average reader would be but little wiser.

It may not be out of our province, however, to express the opinion that the price is not likely to be immediately reduced. The coke men have been for some little time losing money, and we think that they will not be in a hurry to return to former prices.

Krank's Korner.

That it is a difficult task to introduce machines into the foundry seems to be the accepted opinion of all who have made the attempt.

* * *

"Prejudiced against machines" is the remark commonly made by the unsuccessful agent upon the foundryman's views in this matter, when the fact is that a foundryman is no more governed by animosity against adopting something new than any other human being in the same case.

* * *

When it is declared, with more or less fervor, that prejudice blocks the advance of improvements, that old ways and ideas control the foundries to a great extent, we feel safe in saying that there is something missing here which must be read between the lines.

* * *

Competition is certainly strong enough among our foundries; yes, in some localities it even smells badly, to cause any foundry to welcome whatever would effect a saving, and yet prejudice is alluded to as being a barrier in the foundry against improvements.

* * *

Special reference has been made to an apparently stubborn inclination of foundrymen to hold on to existing methods in connection with molding machines, which have been found more difficult to introduce universally than other appliances, such as the geared ladle, improved cranes, cupolas, sand mixing machines, tumbling barrels, etc.

* * *

The percentage of prejudice which a foundryman contains will, upon analysis, show

itself to be no larger than that possessed by men engaged in other pursuits. The gist of this matter is that those who have been intrusted with disposing of foundry appliances, molding machines among the number, have, in bumping against some members of the foundry fraternity, received an erroneous impression, and it is admitted that in some cases this has not been delivered very delicately.

* * *

Obstacles present themselves against nearly everything that is new, but the greatest of these, which hinders the introduction of improved mechanical appliances in the foundry, is the same as would attend the creation of a demand for any new article in any other industry, lack of proof that their adoption will be followed by success financially.

* * *

A molding machine is not a universal, but a special tool, and the great trouble it finds in introducing itself comes from the inability to say where it will prove itself a profitable investment. The rapidity with which designs change, and the uncertainty of receiving orders for castings under contract at stated intervals by one firm successively, causes the aid which a molding machine could give in many instances to be rejected.

* * *

To call these reasons prejudice may make them a good cloak to hide under, but if this garment is to be worn much longer it needs patching, for already it exposes some of the true influences dominating people who have foundries in not discarding an old process until a new one is found that is better. The refusal of these to make investments unless they are assured that they will at least receive their money back.

* * *

Of the fact that for nearly every move a molder makes, or one that is equally as good, can be reproduced mechanically, there is no dispute. Neither is there any doubt but what molding machines are deserving of occupying a much larger field than is at present allotted them. The only question to be applied to individual cases is, will the benefits derived exceed the cost? It is called bad judgment when an investdrymen, who tore down an old style cupola and put in a patented complication, without earning interest on the money invested, or who were induced to install a molding machine in a line of work for which it was never intended, will probably study a while before repeating it in any other direction. The wide difference that exists in the product of foundries, and the changes to which this is subject, justifies to a great extent the hesitation with which advance agents are embraced.

* * *

A machine cannot think nor be made to do so, and the attempt to use them for this purpose always results in failure. We sometimes run across some benevolent individual who has never been soiled by too close contact with a foundry imagining that he can operate it automatically, but finds out to his sorrow that brains cannot be dispensed with altogether, but these sort of characters are as scarce as the foundryman who would, on account of prejudice, refuse to adopt better tools that were sure to yield him an increased profit.

* * *

As regards the introduction of molding machines, it is not a question of their being able to perform the work for which they are made, it is simply a financial problem, of which no one is in a better position to judge than the one who will have to pay for them. A dozen instances could be cited, however, where half of the outlay spent in purchasing machines would have yielded a greater return if invested in some of the smaller things which make up the conveniences of the molder and aid production so materially, yet are lacking for no other reason than because "We always got along without them."

The National Association of Manufacturers.

—The National Association of Manufacturers has been advanced another stage on its journey towards securing for its members and the manufacturers of the country the advantages enumerated in its constitution, and referred to at length in the resolutions adopted at the time of its organization. This has been done by the meeting of the executive committee, held at the Manufacturers' Club, in Philadelphia, March 13 last.

Arrangements were made for pushing to-

wards completion the work of organization, and an address has been issued to the manufacturers of the country, signed by the officers and members of the executive committee, that ought to result in the formation of manufacturers' associations wherever a sufficient number can be found to support one.

It was further decided that the first meeting shall convene in Chicago, October 15, 1895. Herewith we present to our readers the portrait of Mr. Frederick W. Sivyer, Vice-President for Wisconsin, and a member of the executive committee. Mr. Sivyer

FREDERICK W. SIVYER.

was born in Milwaukee in 1848, and has been a resident of the Cream City ever since. For several years he was Secretary of the Minerva Furnace Co., engaged in the manufacture of pig iron, but even then commenced to take an interest in the rapidly developing malleable iron business, with which he has been more or less identified for twenty years.

He is now President of the Northwestern Mall Iron Co., employing 450 hands, and Vice-President of the Chain Belt Co., employing 125 hands. He is also school commissioner for the city of Milwaukee and chairman of the manual training committee, and takes a deep interest in both and educational matters in general, and is, besides, a director of the Merchants' and Manufacturers' Association of this city.

The Philadelphia Foundrymen's Association.

The regular monthly meeting of the Eastern Foundrymen's Association was held at the Manufacturers' Club, Philadelphia, April 3. A large number of members were present, and seemed greatly interested in the live papers presented.

Mr. Burt Whitely's paper on the subject of melting by gas was quite interesting. Mr. Whitely wrote:

To the President and Members of the Foundrymen's Association:

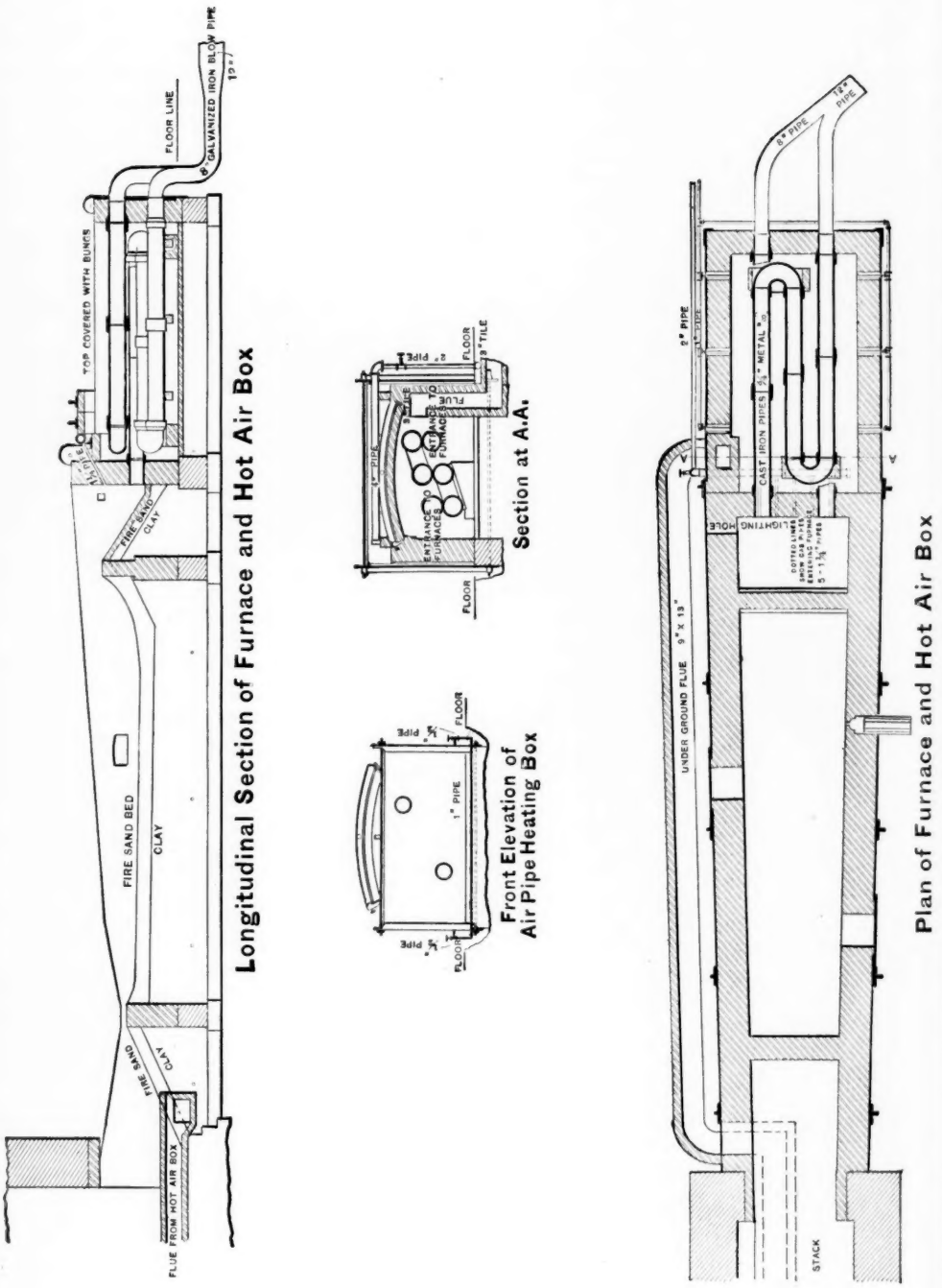
Gentlemen—Some time ago I received a letter from Mr. Howard Evans, your secretary, extending to me an invitation to present to your association a paper explaining the process of melting gray iron with natural gas. I assure you that I appreciate the honor of having the privilege of presenting such a paper, inasmuch as I am not a member of the Foundrymen's Associaion. While the natural gas subject is comparatively a new one to me, I shall certainly take pleasure in giving you a description of the process that we are using, and have been using for the past six months, with good results.

You certainly would not be interested in going over all of the details of the different experiments which we have tried, and I do not wish to take up your time by enumerating the difficulties that we experienced. The two principle things that we had to overcome was first to get the iron fluid enough, and next to keep it soft.

I hand you herewith a tracing of the melting furnace as we have it now, which shows the arrangement of the gas and air pipes.

This furance, for the sake of description, we will say, is composed of two parts—the melting furnace proper and the heating chamber. You will observe there is very little difference between the melting furance such as we use and the regular malleable iron reverberatory furnace.

The first experiments we made in the melting of gray iron with natural gas, we introduced cold air directly into the furance at the same point where the hot blast now enters. The trouble that we experienced was that the iron became oxidized, and when it was fluid enough to pour the latter part of the heat would get too hard. We were then introducing our gas through the same pipe under 50 pounds pressure, and the air under about 8 ounces pressure. This arrangement



THE WHITELY FURNACE FOR MELTING IRON WITH NATURAL GAS.

was also very hard on the furnace, especially as the combustion took place about 24 inches from the point that the gas and air were introduced. We tried many different ways to overcome these troubles, until finally we have the furnace in the present shape. We find that it is necessary to heat the air or blast quite hot before it is introduced into the furnace, and by so doing we have been enabled to decrease the pressure from 8 ounces to 3 ounces, and have decreased the gas pressure from 50 pounds to 12 ounces.

The heating chamber is made quite hot by three burners of natural gas, introduced on either side. The pipes through which the air passes into the heating chamber are made of hard iron and the joints corked with asbestos packing. We tried both wrought iron and gray iron pipes, but they would not stand the heat. By this arrangement we have also very materially reduced the wear on the furnace. Under the old plan the bungs would burn out in six or eight heats, and under the improved plan we think that they will last from four to six months. We are able to run about twenty heats out of the furnace before it becomes necessary to put in a new sand bottom, which can be done in a couple of hours.

The furnace is charged, operated, skimmed, etc., just the same as any malleable iron furnace. We melt from 2½ to 7 tons at a heat, and if necessary can run four heats in ten hours.

By this process we are enabled to change our furance in 30 minutes after it it first fired. It takes us about two hours to melt the iron sufficiently hot to run very light castings.

As soon as the iron is skimmed, tested, and ready for pouring, all of the hot blast is shut off, and we merely keep enough gas turned on to retain the heat, and while it may seem that the gas or extra heat would have a tendency to make the iron hard such is not the case, as it is impossible to tell from test bars the first from the last of the cast. We have held the charge in our furnace for over an hour after it was ready to pour, in order to see what we could do with it, and there was not perceptible change in the iron as to hardness or closeness of grain.

In order to demonstrate the strength of the iron we have to-day made some tests, the bars being one inch square, 24 inches between centers. One of them stood a breaking strain of 1,615 pounds and the other 1,625 pounds. The iron is soft and tough, and I will endeavor to send you some samples of it for inspection.

In regard to the mixture, it was made up of 35 per cent No. 2 Sewanee iron, 35 per cent No. 2 Sharon iron, 5 per cent of 12 per cent Silicon iron, and 25 per cent of Machinery scrap. We did not buy this iron with the expectation of using natural gas. In the future we expect to discontinue the high Silicon iron, using 1-2 No. 1 pig iron, and from 30 to 40 per cent Machinery scrap.

The process thus far is very satisfactory, and we can make any kind of castings from heavy rolling mill work to the very lightest of gray iron castings.

I extend to all members of your association a hearty invitation to visit our factory whenever they find it conevnient, and we will endeavor to explain the process and furnace more fully. I will also be pleased to answer any correspondence and give any further information of the subject that I am possessed of.

As I said before, this is a subject that is comparatively new to us, and I regret very much that I cannot give you a better description, but we expect to be making experiments from time to time in the manipulation of natural gas, and if the Foundrymen's Association should be interested on this subject we will be pleased to present anything that we think would interest you.

I regret very much that I am not able to present this paper in person, and trust that at some future time I may have the pleasure of meeting with you.

The paper on Machine Moulding, with special reference to the manufacture of gears, by S. Groves, was as follows:

One of the cheering sings of the times is the manifest revival of interest in the art of iron founding. In days gone by, the mechanical genius of the world was largely devoted to the invention of special tools and labor-saving appliances for handling and finishing rough castings in the machine shop, after leaving the foundry, whilst the foundry itself was left to struggle fitfully along with its old-fashioned cupola, erratic fan, dangerous drop ladle, stationary jib crane, wasteful core oven, primitive hand riddle, flexible wooden flasks and costly patterns, all operated by and applied by the rule of

Plan of Furnace and Hot Air Box

thumb. But a change has come over the scene. The foundry, like all things in the world, has been passing through the evolutionary process. Dark, gloomy, comfortless foundries, stifling hot in summer, intensely cold in winter, and altogether devoid of ventilation, are no longer universal; for, dotted here and there over the States, may now be seen well lighted and admirably ventilated shops, with iron roofs and brick walls, equipped with electric traveling cranes, sand sifting machines, trundle geared ladles, tumbling barrels, direct acting cycloidal blowers, economical air furnaces, testing apparatus, and wonderfully conceived moulding machines, which are fast transforming the iron founders craft from an art into a science.

The great pleasure is ours of being able this month to present to the readers of THE FOUNDRY a portrait of Mr. S. Groves, who is referred to elsewhere as having read a paper before the Philadelphia Foundryman's Association.

Samuel Groves was born at Woodside, near Dudley, Worcestshire, England, on December 5,

SAMUEL GROVES.

1855. When four years old, his parents removed to Derby, then to London, finally settling down at Middlesborough, the Ironopolis of England, in 1861. After leaving the private academy, where he received his education, he entered upon and served a seven years' apprenticeship as draughtsman and mechanical engineer with Cochrane, Grove & Co., engineers and ironfounders. For twenty-one years he remained with this firm, performing his duties manfully and well, and winning the love and respect of all with whom he came in contact, as the beautiful gold watch he carries amply testifies.

When only seventeen years old he received a Queen's Prize and First Class Advanced Certificate for Machine Drawing and Construction in the Government Examination, and from that time took an active interest in intellectual pursuits, carefully preserving his health by athletic exercises, winning well earned laurels on many an English cricket field and football ground. In 1884 he was elected a member of the Ormesby School Board, and re-elected in 1887, unopposed. In 1885 he was elected a Fellow of the Society of Science, Lettersl and Art in England. But in telling the story of his interesting career during the years of early manhood, one can not do better than quote from an editorial which appeared in the North Eastern Gazette on the occasion of his leaving North Yorkshire in June, 1889, when he was presented with a gold watch, silver inkstand, mounted walnut inkstand, illuminated address, purse of gold, and poem in honor of himself and Mrs. Groves, from the various political, educational and social organizations with which he had been connected.

"The district will be the poorer by the removal of Mr. Samuel Groves. No young man was better known or more generally appreciated than he. An earnest Radical, temperance advocate, and leader in local, social, and religious movements, he was ever welcome amongst a large circle of friends and acquaintances.

"In his early youth he was to the front as a singer. Possessed of a sweet tenor voice, as a member of the then Middlesborough Choral Society and the famous Welsh Choir, he made many friends. The once flourishing Middlesborough Debating Society, the Park Street Mutual, and the Students' Association, all helped to cultivate the talent he possessed for speaking in public, and he invariably maintained his own in debate.

"In politics Mr. Groves was a thorough Radical, and has often on the platform proved acceptable and useful in expressing and enforcing Liberal views. He did yoeman service for the Liberal cause at North Ormesby, and was a member of the Executive of the Middlesborough Liberal Association. It will be in the memory of most of our readers that at the recent County Council election for the Ormesby Division Mr. Groves led the opposition against Mr. J. S. Pennyman, of Ormesby Hall, which resulted in his retiring and leaving the field open for the unopposed return of Mr. Isaac Wilson, M. P.

"In local matters Mr. Groves made his influence felt, which was always seconded by the workingmen of North Ormesby. His return as a member of the School Board—for which post he was nominated by the Ratepayers' Association—his success in the movement in favor of a reduction in the price of gas, his advocacy of measures and men in conection with the Ormesby Local Board, showed great ability and tact.

After sixteen months in the County of Derbyshire he removed to Gateshead on Tyne, in No-

vember, 1890. But the business outlook at that time being far from bright, and the future of his five boys in overcrowded England being an enigma, he determined to realize the dream of his childhood and go to America.

On the 14th of March, 1891, the Groves family arrived in New York and shortly afterwards Mr. Groves accepted a position in Pittsburg, Pa., where he remained one year, going from there to Cleveland to become assistant to Mr. John Walker, at that time manager of the Walker Mfg. Co., where he remained until 1894. During this year he became conected with the Union Foundry & Machine Co., of Pittsburg, Pa., where he occupies a responsible position, giving especial attention to their foundry work, for which he has always had an especial fancy.

Gear making and gear construction are both subjects in which he has taken especial interest, and having some original ideas that he has recently put into successful operation, together with the fondness he has shown towards foundry subjects, has brought him rather prominently into notice.

Space prevents our referring to is skill as a musician or artist, his fondness for all that is best in the world of literature, or his ability as a speaker, but they are such as to warrant the statement that among those deserving and worthy of any honor that may be conferred by American foundrymen, Mr. Groves stands out as a star of the first magnitude, and the Union Foundry & Machine Co. deserve the congratulations of those interested in the business that they have secured his services.

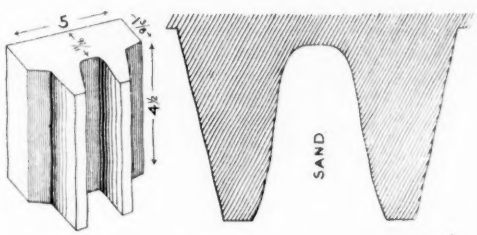
Whilst, however, there is reason to be encouraged by the recent advances made in the better equipment of foundries, it is a deplorable fact that works where a complete outfit of the modern devices I have enumerated, are in operation, can almost be counted on the fingers of one's hand. Indeed, if the exhibits at the World's Fair might be taken as a criterion of the present condition of the ancient art of founding in metals, as regards specialized machinery, then iron founding, instead of being a world-wide, progressive industry, may be viewed as a degenerate branch of trade; for, with the exception of the Tabor Moulding Machine, exhibits of labor-saving machines for the foundry were conspicuous by their absence. Think of the immense business being done every year in the manufacture ofcast iron water and gas pipes for our great cities; steel ingots for transformation into rails; oil boxes, brake shoes, etc., for railroad cars; valves, tees and elbows for boiler fittings; belt pulleys and gear wheels for mills and factories; castings which are mostly duplications of each other, and the making of which have brought a fortune to more than one firm who have been wise enough to utilize moulding machines in their production. These corporations did not, as a matter of course, exhibit their special machines at the Fair, for that would have touched the sensitive pocket-nerve, and tended to break down monopoly; consequently the world was left in almost complete ignorance of the magnitude and importance of the iron founding industry in this country.

I, for one, am convinced that the ruinously low prices of to-day in the general foundry business are largely due to the introduction of machine moulding. There was a time when foundries in every city and town could get a fair share of almost everything demanded in the shape of castings; but now if belt pulleys are required, say in Pittsburg, the buyer goes to Philadelphia, where they can be procured in larger quantities in a given time, and at prices which make the hair of the uonservative manufacturer almost stand on end; simply because a firm in the Quaker City, whose doors are guarded as strictly as a military arsenal, have hydraulic moulding machines, upon which two men turn out 100 per day, instead of 18 or 20 per day by the old method of hand moulding. And a like condition of things holds good in the manufacture of all the castings in greatest demand, suuh as pipes, car wheels, brake shoes, steam pipe fittings, gears, etc. Some half dozen enterprising concerns in this State have practically acquired a monopoly in the making of these items of tonnage, because they mould them in larger quantities on machines, by unskilled labor, instead of in small quantities by costly hand labor. The remaining 600 foundries in Pennsylvania are practically left to compete for the general jobbing work, which is only limited in demand, and which involves constant making of new, or the everlasting changing of old patterns. In view of this keen competition for the tag end of the foundry business, it is no wonder that prices are low, and likely to continue low. The only salvation of foundrymen is to get abreast of the times in the matter of labor-saving appliances and machinery for the more economical and greater production of castings.

In December, 1894, an exhaustive paper was written by Mr. Harris Tabor on the advantages of moulding machines in general, setting forth with remarkable lucidity and

unanswerable logic the economic aspects of the question. It is unnecessary, therefore, for me to dwell further upon that aspect of the question; neither is it my intention to describe in detail the various methods and processes of machine moulding, for the time at my disposal is too limited, even were I competent to do so; but with your kindly indulgence, I purpose describing, with some degree of minutae a branch of machine moulding, which has hitherto been guarded with great secrecy—almost shrouded in mystery—viz: the moulding of Gear Wheels by machinery. This line of business until the last year or so, has practically been confined to Baltimore, Maryland and Cleveland, O.; but now Pittsburg, Pa., commands a fair share of the trade. The advocate is always in danger of magnifying the importance of his theme, but when it is remembered what an immense number of gears are needed for the driving machinery, in the mills, factories and workshops of the world, it is almost impossible to exaggerate the importance of the gear trade, and assuredly I do not err in placing the moulding of gear wheels, especially those of magnitude, in the very front rank of iron founding, for as regards smoothness of skin, definition of form, equality of shrinkage, and strength of material, there is no branch of moulding where so much care and judgment is needed; the slightest irregularity of form, unequal spacing of teeth, or abnormal shrinkage, is enough to condemn a gear wheel casting, hence it is not surprising that the old-fashioned plan of moulding gears from full patterns fell into disrepute, and of necessity lead to the invention of machines for cutting the teeth of the gears out of blank castings, which, although giving smooth running, does so at the expense of the life of the wheels by removing the hard skin or combined carbon from the the flanks of the teeth, thus leaving the opener grained iron for a wearing surface, and at the same time increasing the cost of the gears.

That machine moulded gears are superior to hand moulded gears needs in these days of enlightenment no elaborate proof. Pattern moulded gears are necessarily defective, for the diameter at the opposite ends of the teeth must be unequal, owing to the draft, whilst the rapping needed to draw the patterns oftimes causes the wheel to be out of round. Besides, whoever saw a full pattern drawn without patching; it is true, the defect due to draft is practically overcome by carefully meshing the gears with "cope" and "drag" together. But even where the first castings from complete wooden patterns are fairly acquired, the wraping and soaking with water essential to the withdrawal of the pattern from the sand, causes it to warp; so that oftimes when the pattern is taken out of the store for subsequent castings, it is found to be radically out of shape that another expensive pattern has to be made. Then again, look at the area needed to store these complete patterns, especially the larger sizes, and the cost of caring for them, and insuring them. Only recently I visited the works of a firm of high repute, who at one time did a very extensive gear business, and I passed with amasement through several commodious buildings, stocked with hundreds of complete wooden patterns, occupying a space upon which could be conveniently built an average foun-



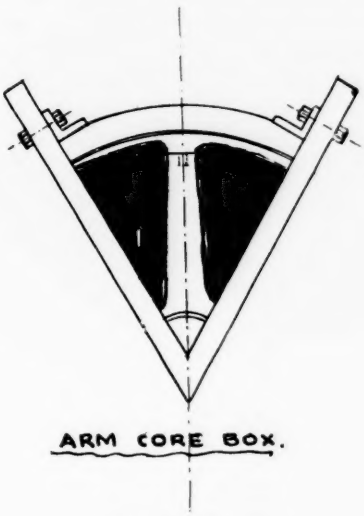
GEAR BLOCK AND PLAN OF TOOTH.

dry. Special precautions had been taken in case of fire, and the building and patterns were heavily insured.

Having criticised the old-fashioned system of moulding gear wheels, I now proceed to establish my proposition, that the comparitively modern system of moulding gear wheels by machinery is unmeasurably superior to the older method of hand boulding. In the first place, take the question of pattern. Say a spur gear 40" diameter, 84 teeth, 1½ pitch, 4½" face. A complete pattern would take six days, and cost $25; but if intended to be made on a machine, the only patterns needed would be a single tooth block, thus:

For making the teeth, a box for making the green sand arm cores and hub, and another plain box for making the dry sand center core. These preparations would be made in, say, two days, at a cost of about

$10. The work would be in the foundry, and at least four wheels cast, cleaned and in the machine shop before the complete pattern was into the foundry. With ordinary care, 100 castings could be made off these preparations, without any appreciable diminution in the matter of accuracy and finish. And it is possible to store preparations for a thousSnd different sized gears in a room 30x20 feet, whereas a like number of full



ARM CORE BOX.

patterns would need about an acre of land.

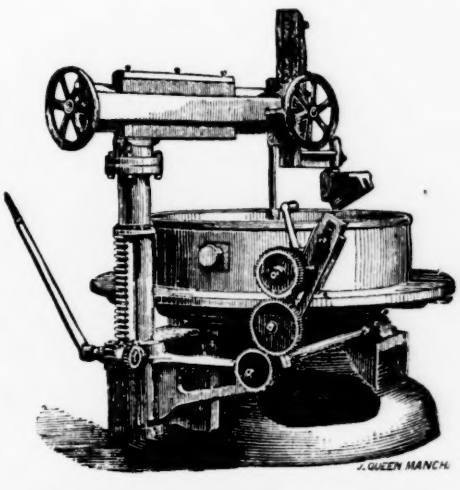
Jackson, of Manchester, England, was the first to mould gears by machinery; then followed the Scott Machine, with its center spindle, moveable arm, easily disarranged parts, difficult adjustment, laborious system of leveling, and altogether slow speed process; but for all that, a great advance upon the ancient plan of hand moulding.

This machine was deemed quite a wonderful invention in its day, but is now passing into the museum.

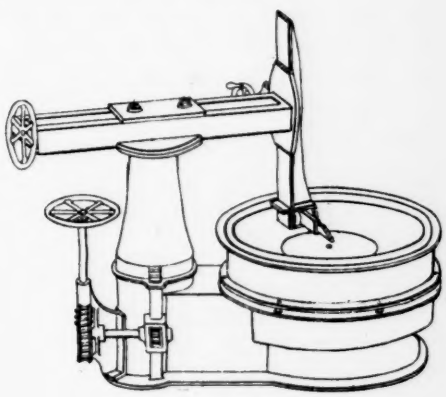
Then Whittaker, of Oldham, England, introduced his machine, and was awarded a diploma at Manchester Industrial Exhibition in 1875.

Perceiving the inherent defects of a central spindle, moveable arm, and fixed table, Whittaker designed his machine on an entirely opposite plan, for he abandoned the central spindle altogether, and revolved the flask table instead of the tooth block arm.

This system proved to be so superior to the older plan, that all subsequent machines worth mentioning have been designed and constructed on these lines.



WHITAKER MACHINE.



THE WALKER MOLDING MACHINE.

On October 18th, 1875, John Walker, an Englishman, then residing in Indianapolis, was granted a patent by the U. S. A. Patent Office for a gear moulding machine, the only difference between which and the "Whittaker" machine exhibited at Manchester six years previously, consisted in the mode of centering, leveling and supporting the flask from the back. In every other respect it was identical, as the illustrations exhibited will show:

During the last twelve years two firms, viz: Robert Poole & Sons, of Baltimore, and the Walker Manufacturing Co., of Cleveland,

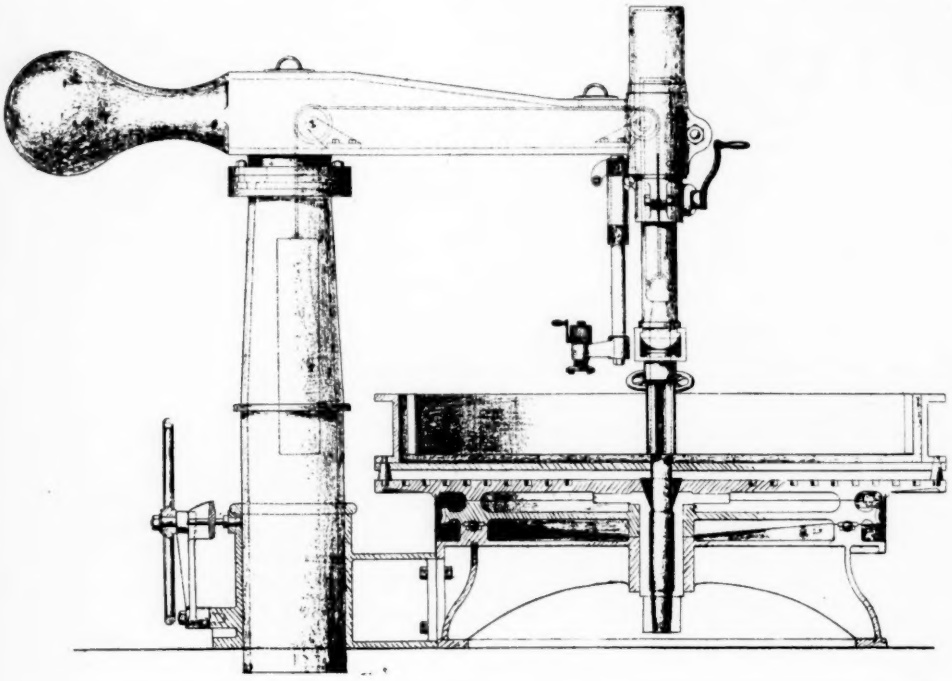
O., have built up a first-class reputation and trade by the manufacture of gears on the machine invented by John Walker, which the Poole Company have the right to use, and the Walker Company absolutely control, since the latter company purchased the patent right by assignment.

Perhaps the greatest contribution of John Walker to the machine moulding of gear wheels was his patented striking machine, the use of which renders it unnecessary to connect "cope" and "drag" together until the teeth are finished, the arm cores placed, and center core fixed in the "drag." By this method a great saving of time is achieved, and production, and it is my pleasure now to direct your attention, gentlemen, to an improved gear moulding machine, which I hesitate not to affirm, is altogether superior to anything of the kind in existence today.

I do not scruple to illustrate this machine, since steps are now being taken to amply protect the interests of the inventor.

You will perceive that the outside mast, stationary arm, and moveable table have been adopted, but there are important features entirely new and original:

(1) The cross arm or jib is balanced, as also is the vertical tooth block spindle, thus



THE GROVES MOLDING MACHINE.

for whilst one man is moulding the teeth on the moulding machine table, another moulder is forming the cope on the striking machine, or making the green sand arm cores on an adjoining table.

But we live in an era of progress, and inventions which a few years ago were looked upon as the flower of mechanical ingenuity, are found by experience to be susceptible of even further improvement, on the lines of greater simplicity of parts, and easier adjustment, with consequent economy in labor guarding against the undue straining and springing, which is a chronic defect of all existing machines.

(2) The flask table is capable of much easier movement, since it is supported on ball bearings, rolling in carefully turned grooves, and each 9" apart.

(3) The precise centering and alignment of the tooth block spindle and flask table is secured by a tapered sweep spindle.

(4) The lifting and lowering of arm is done by means of the well known trundle

gear, the prime mover in which is a pinion with only two teeth.

(5) The tooth block pattern is lifted from the mould vertically by a permanent rack, as in the older machines; but it can also be withdrawn horizontally by a special eccentric device, constituting a duplex arrangement altogether unique and original.

(6) But probably the most economical improvement of all is the substitution of an index plate for spacing the teeth, in place of the expensive and inconvenient system of change gears, found on the "Scot," "Whittaker" and "Walker" machines, which means equal accuracy and easier operation; and at the same time saves the expense of an immense number of cut gears, thus making this machine self contained.

(7) And finally, a great saving of time and labor is affected in the preparation of the ring of sand for tooth backing in the drag, by means of an original attachment, by which one-quarter of the sand backing is made at a time, thus saving the complete filling of the flask with sand, ramming and then digging out the middle, ready for sweeping the backing form.

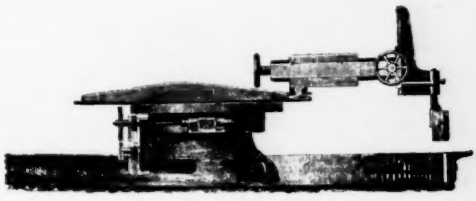
This machine, invented by myself, is operated by the Union Foundry & Machine Co., of Pittsburg, Pa., who have the right to manufacture upon it. By its use gears of all sizes from 6" up to 72" diameter, with every form of tooth, straight spur, bevel, helical, or staggered, can be moulded with much greater ease, accuracy and dispatch than has hitherto been attained upon any other moulding machine in existence.

Having described the modus operandi of the latest gear moulding machine, for comparatively small sizes, I would here point out that it is not advisable to make gears over, say, 72" to 84" diameter—with large pitch and deep face—on the table machine, owing to the excessive friction thrown on the bearings, and worm gearing, and undue tension on the operating shaft. Gears of large magnitude are, therefore, usually made in the floor, either in a cast iron cylindrical ring, or brick wall embedded in the sand, over a well ventilated coke bed. The machine used in the moulding of large gears in the floor is portable, so that it can be carried to any part of the foundry.

The "Whittaker" plan is to detach the tooth block, cross arm and holder from the fixed mast, and bolt it direct to the flask table, thus:

Whilst the "Walker" machine consists of three focussed arms fixed to a circular ring supporting a telescopic drawback for moulding the teeth.

The machine used by the "Union Foundry," of Pittsburg, is one designed by myself, and consists of a center spindle fitted with an index plate and eccentric drawback. This machine is simple in contruction, easily adjusted, efficient in operation, and has done excellent work in large gears during the last 12 months, the largest being a Double Helical Spur Gear 14'-2" diameter, 20" face, 4½" pitch.



WHITTAKER MACHINE FOR LARGE GEARS.

weighing about 15 tons; it was cast as a whole, split, and the halves secured together by oval hoops, tee headed links and bolts.

This gear, with its complementary pinion, is now running in the Penn avenue cable power house of the Citizens' Traction Co., Pittsburgh, Pa. And we have just delivered a "Union" tooth spur gear to the National Tube Works, McKeesport, Pa., 8'-4" diameter, 7" pitch, 22" face, weighing near 12½ tons, and which is to displace steel. A test bar taken out of the ladle from which a 4¼ pinion for this latter gear was poured, was broken on the Riehle machine of the Clinton Iron & Steel Co. and registered a tensile strain of 38.195 pounds per square inch. The chemical analysis of this metal is as follows:

Silicon	1.25
Sulphur	.058
Phosphorus	.93
Mananese	.32
Graphite	2.85
Combined carbon	.40

You will notice the silicon is exceedingly low, but I have long held in practice that for heavy castings where the thickness ranges from 2" to 3" thick, 1.25 to 1.50 silicon may be taken as an ideal proportion. You will also observe that the phosphorous is high, and it may be of interest to you to

know that in all the tests of iron mixtures which have proved of high tensile strength, the percentage of phosphorous has been comparatively high.

In the Engineering Magazine for March is an article entitled "The Conquest of Steel Over Cast Iron." When the steel founder can ensure perfect freedom from blow holes, guarantee equal shrinkage and mould gear teeth without the corrugations which disfigure almost every steel wheel yet made, then probably cast iron gears may be relegated to the museum; but so long os the iron founder can mix metals capable of standing a tensile strain approximating to 20 tons per square inch, produce machine moulded castings perfectly accurate in pitch and round in form, with the surface of the teeth flanks so clean and smooth that the moulder is censured if the chisel of the chipper has to be used on a single tooth—I say, so long as these perfections in the machine moulding of cast iron gears exist—over against the chronic defects incidental to castings in steel—it will be many a day before steel will conquer iron in the manufacture of gears; in fact, the pinion and gear last mentioned are to substitute steel—which failed for the negative reasons indicated.

Having directed attention to the mechanical side of madern gear moulding, I would now remark that hard earned experience has demonstrated the wisdom of using green instead of dry sand cores for making the arms and hub—especially the larger sizes—since the former offer less resistance to shrinkage and at the same time constitute a much better medium for venting and letting out the confined gases than the hard, flour thickened, brick-like cores made of dry sand. In presenting this subject, the wise may think I have been unwise in giving too much away; but the possession of the best gear moulding machine in the world will not enable everyone to turn out first-class gears. It needs in addition carefully trained moulders, skilled in the ramming, venting and coating of the teeth, acquainted with the formulae for mixing the special facings and sands, and familiar with the proper method of covering in and gateing the moulds.

In conclusion, permit me to say that I appreciate highly the honor of being invited to read this imperfect paper of mine before the Foundrymen's Association, an institution which has done not a little towards elevating the iron founding industry, and placing it in its proper position before the country. If I have succeeded in interesting anyone in machine moulding and better equipment of foundries, my effort will not have been in vain. Hitherto in engineering works the foundry was always the last considered, and in showing visitors around, the introduction to the foundry department was invariably prefaced by a humiliating apology. I believe, with Ruskin, that good work can only be done when a man is in love with his trade. One of the main causes why the average moulder in days gone by was looked down upon as a dust-begrimed, beer-soaked, degenerate being, was, doubtless, owing to the dismal surroundings of his daily work, in which no one seemed interested, except in the matter of results. Which of you gentlemen ever think of placing your sons in the foundry? The ban of respectability is upon it, and it is the last place thought of. I verily believe that the general introduction of machinery, the building of scientifically planned shops, equipped with the latest labor-saving devices and appliances, will do more than any other thing to elevate the moulder and lead him to appreciate the dignity of his labor; and also to develop trade on the lines of greater economy and production. I, for one, confidently look forward to the "good time coming," when, by the means set forth, the trade of an iron founder will be looked upon even as a worthy profession, and the foundry business exalted to its rightful position, as one of the most important branches of the industrial world.

Obituary.

Henry William Ellicott, a retired iron manufacturer, died in Baltimore March 19th. He established in 1853 the Ellicott iron furnaces and foundry at Ellicott City, Md.

The Hon. Henry W. Clapp, ex-Mayor of Concord and ex-assemblyman, died March 24th. He had been in the foundry business there for thirty years.

Geo. M. Landers, of New Britain, Conn., of the firm of Landers, Frasey & Clark, died suddenly at his home there of heart failure March 25th.

John McCulloch died rather suddenly at Freeport, Ill., March 8th. He was universally respected and stood very high in the estimation of all who knew him. For many years he had been engaged in the foundry business.

An Apology.

We regret very much to have to announce that we neglected to give credit in our March issue to our enterprising contemporary, MACHINERY, of New York, for the interesting article we copied from their columns, entitled "The New Shop Courses at the Armour Institute, Chicago." This was an oversight for which we hasten to make amends.

Fires.

The Perkins Foundry & Machine Co., at Amsterdam, N. Y., suffered $10,000 by fire March 24th.

The foundry of Hedgewald & Co., New Albany, Ind., was damaged to the extent of $25,000 by fire March 29th. Insurance, $8,500.

The foundry of the H. N. Strait Mnfg. Co., at Kansas City, Ks., was destroyed by fire March 13th.

The Auburn Foundry & Machine Works at Auburn, Ind., burned March 22. Loss $40,000. Insurance $30,000.

The entire works of the Chelsea Stove Co. at Chelsea, Mich., were destroyed by fire March 25th. Loss, $50,000. Insurance, $31,000.

New Foundries.

P. B. Lamoreaux has his new foundry at Owatonna, Minn., running.

The McKeesport Supply Co., McKeesport, Pa., will build a new foundry.

C. F. Christopher is erecting a foundry at Spartenburg, S. C.

Yonker & Winchester will erect a foundry at Eldora, Ia.

Patrick Borne is building a new foundry at Waseca, Wis.

M. C. Redden will build a foundry in Syracuse, N. Y.

J. W. Reed will start a new foundry at Warren, Ind.

Miles Warren has reopened the Warren foundry at Flint, Mich.

The Fitzgibbons Boiler Co. will erect a foundry at Oswego, N. Y.

The Franklin Foundry Co. will erect a foundry in Indianapolis, Ind.

The Joseph N. Pennel Foundry Co., of Scranton, Pa., contemplate moving to Mt. Carmel, Pa.

The Batolipas Mining Co., at Chihuahua, Mexico, intend erecting a modern foundry in that country in the near future.

G. Geiselhart is master mechanic.

C. D. Meyer has prepared plans for a machine, foundry and blacksmith shop for the National Foundry & Machine Co., Louisville, Ky.

The architectural iron works located at Canonsburg, Pa., will shortly be ready for business. The foundry is 75x160 feet and fitted with all modern equipments.

New Buffalo, Mich., has given a bonus of $3,000 and five acres of land to a Chicago syndicate to secure the establishment of a brass foundry at that place.

The Hill Foundry & Machine Company, Anderson, Ind., have let contracts for the rebuilding of their foundry. The present structure will be torn down April 1, and the work of re-erection will follow immediately.

Among the Foundries.

Charles Crosby is now sole proprietor of the Asher foundry, at Hillsboro, O.

The Phenix Foundry, Omaha, has been closed by the sheriff.

George B. Scovill, iron founder at Waterbury, Conn., has assigned. The liabilities are said to be $70,646, of which $53,369 is secured by notes and mortgages.

The Reading Foundry Co., at North Reading, Pa., has resumed work with enough orders on hand to keep them busy for some time.

Hugh B. Davidson, foreman of the Empire foundry at Lansingburg, N. Y., for twenty-five years, has taken charge of the Clinton foundry at Troy, N. Y.

At Augusta, Ga., C. F. Lombard and the Pendleton Iron Works have consolidated and will be known as the C. F. Lombard Iron Works & Supply Co.

The Rogers Foundry & Stove Co., at Belleville, Ill., has been sold for $15,000. Two Belleville banks hold a claim against it of $21,000.

The Adams Co., at Dubuque, Ia., have adopted the trolley system for conveying iron to the molds in their foundry and for conveying castings to cleaning room, etc. Some of the trolley ladles hold 600 pounds.

At the foundry of Heywood, Wilson & Co., in Fitchburg, Mass., there was recently cast a table for a planer, which weighed 12 tons. It will be used by the Fitchburg Machine Company.

The Medina Foundry Co., Medina, O., resumed March 25th, after a seven weeks' shut down caused by fire.

Geo. E. Webber & Co., hollow-ware manufacturers, Medina, O., are running full handed and are very busy.

The Chattanooga Car & Foundry Co. are filling a large government contract for guns and gun carriages with which to ornament the National Park.

The Warren Foundry Company, of Warren, R. I., have been reorganized, and in addition to their present business of manufacturing stoves and ranges will turn out a general line of machinery castings. The company's plant will be enlarged to accommodate the enlarged business.

Kaukauna, Wis., rejoices in the possession of one of the leading plants in America for the manufacture of wall paper machinery. At Wm. Libert's place in that town there is now in course of erection one large machine that will print 12 colors at once on the ordinary wall paper.

Who says Business is Bad.

The Scow Bay foundry, at Astoria, Oregon, has resumed after a long idleness.

The Crucible Steel Casting Co., at Canton, O., will soon have their works running.

The foundry plant at Braddock, Pa., has been started and will make all the castings for the Carnegie Co.

The Westinghouse works, at Wilmerding, Pa., are running with a full force full number of hours for the first time in eighteen months.

The American Steel Casting Co., at Thurlow, Pa., has decided to start up the plant at Sharon, which has been idle for more than a year.

The car works of the country all seem to be busy, conspicuous among the number being the Memphis Car & Foundry Co., Memphis, Tenn., the Ensign Mfg. Co., Huntingdon, W. Va., Michigan Car Co., Detroit, etc.

The Hercules Pipe Foundry, Amiston, Ala., recently purchased by E. L. & A. L. Tyler, has started up after an idleness of eighteen months. About 100 men are employed.

Rathbone, Sard & Co., who have had their Albany, N. Y., plant closed for some time, have resumed with a very large force of men and hope to steadily increase the number.

The Norwalk Iron Works Co., South Norwalk, Conn., manufacturers of heavy air compressers and pumps, which shut down some time ago, throwing 500 men out of employment, has started up again full handed, with orders enough on hand and in sight to keep them busy till fall.

The Parlin & Orendorff Co., at Canton, Ill., have more business than they can handle. They are working sixty molders and could put on forty more if they had room. During the summer they expect to enlarge. They are working day and night.

In Providence, R. I., they seem to be busy

The Minnesota Stove Co., Shakapee, Minn., has resumed work with a full force.

The Bellaire Stove Foundry, at Bellaire, O., has increased its force.

M. Rumley & Co., at La Porte, Ind., are reported as being busy.

What is known as the lower foundry of R. D. Wood & Co., at Millerville, N. J., has resumed after a shut-down of several months.

It is said that the Anderson Foundry & Machine Co. and the Gould Steel Co., at Anderson, are busy.

At Kalamazoo, Mich., Thos. Clarage & Son, Kalamazoo Foundry Co. and George Clark have considerable work.

At Mishawaka, Ind., the Dodge Manufacturing Co. and Perkins & Co. are reported as being busy.

At Indianapolis, Ind., the Brown, Ketchum & Co., Sinker, Davis & Co., Nordyke & Marmon & Co., Ellis & Helfinburger, and Cleveland Fence Co. are reported busy.

Brudett, Smith & Co., at Troy, N. Y., who have had their foundry shut down all winter, are making extensive repairs with a view of starting up again.

The Frost Mfg. Co., of Galesburg, Ill., are busy and have a large number of contracts for engines, clay crushers, etc. They have a night force at work.

NOTICE.

Advertisements inserted under this head for 25 Cents a line each insertion.

CUMMER ENGINE, 16x36 INCHES CYLinder, 120 horse-power, square rim flywheel, 16 feet diameter, shaft 8 inches diameter, Judson improved governor. Address Cummer, care THE FOUNDRY.

FOR SALE AT A GREAT BARGAIN—ALL or part of about 1,800 wooden floor flasks, suitable size for stove plates. Write for particulars. Shepard Hardware Co., Buffalo, N. Y.

FOR SALE—OUR ENTIRE FOUNDRY APpliances, consisting of a cupola, blower, Yale & Towne latest improved traveler of 10,000 pounds capacity, ladles, flasks, etc. Apply for particulars to the Gus. V. Brecht Butchers' Supply Co., St. Louis, Mo.

WANTED—SITUATION AS FOREMAN in shop doing either railroad machinery or light work, by man thoroughly competent and with ample experience. Address Robert Mc., care THE FOUNDRY.

COMPETENT FOUNDRY MAN WITH capital wanted to take a busy foundry. An old-established wrought iron manufacturer who requires a great many castings wishes to sell or lease the same. A good chance for right party to prosper. Address Brooklyn Foundry, care THE FOUNDRY Publishing Co.

A Pattern Maker puts in a Word.

Dear Sir—I have been much interested in the various articles published in your volumes and am very much surprised at not finding mere from my brother chips in the pattern shops, and think if you would only try and persuade some of them to give you some of their valuable notes and hints no doubt that you would place some valuable and interesting matter before your readers.

There are a great many bright and intelligent minds amongst them. If they would, I know they could put a stopping off piece in the right place to fill up some of your valuable pages and add some nice and interesting articles to bring out comment amongst the trade.

I have had lots of experience amongst them and always found them a patient and kind set of workers. Certainly there is no place amounst foundrymen where you can get any more accurate information than the pattern shop, for the first principle of the business is to be accurate, for we all know if the pattern is inaccurate it will lead all others astray and will not mold, etc. And what is more, they have to do lots of thinking and handle many intricate jobs.

There is no shop in all the departments that can save more to the owner.

The patternmaker can fix up, piece up, add a strip, make a core box to lighten out, fix up an old casting; hurry job,only one to be made and that first cast; and he can take a pair of trammels, straight edge, square and level and do a very nice plumb job all with the assistance of the foreman molder, and they get out some very good work from a few pulley rings and anything near shape and size.

They generally have a keen eye and are accurate in measurement; put the shrink on the right place, know how to keep from warps and strains in castings, and they can and do save many dollars by saving the expense of making costly patterns where the price would interfere with the job being done.

But sometimes they are pushed up to the last notch and find the job they have done so rapidly laying around the cleaning shop for weeks. This has a bad effect on both molder and patternmaker, and the boss does not think they notice such things, but they certainly do. The patternmaker is always ready to put his job in the foundry at the time he has calculated on, and can be depended on to do so if he knows his business.

There are lots of so-called patternmakers who have picked up a few points in the business, worked in a railroad car shop and filed, scraped, sand-papered and varnished some little piece of a pattern occasionally, and who come out and know it all, but they do not, as a rule, stay long, as they are soon found out and cannot do anything on time or as it ought to be. Some of them pick it up, as, for instance, the patternmaker is busy and a carpenter is called in. He works a short time and never wants to go back to building a house any more. He knows it all, but soon finds out he only knows less, as it has made a fool of him.

There is no mechanic that earns his money any harder than the job shop man. He must have a large experience. He has no draughtsman to lay out for him and they take all kinds of jobs, from a dumb-bell to a Corliss engine, and he has to know what everybody wants, and he has got to have it out in short order. He must be able to tell at a glance how it will mold the best way, how much it will weigh. He has to please all, make something out of nothing, go to the foundry, see to the setting of cores, have a piece stopped off here, put on there and patch up an old slide valve to have one sure to-day, allow for planing, turning and boring; Put a set of hubs on a pulley, change the lugs on something else. He is kept going all day and at night he is expected to have a day's work done on some new work, although he has been destroying his tools on repairs and alterations. He must have the patience of Job, the eyes of an eagle, and the memory of a dictionary; in fact, he who sets out as a job shop patternmaker must have been raised there.

I have seen some very nice gear made from segments, pistons made from pieces and a great many odd jobs that the patternmaker who is raised in large standard shops would have to think some before attempting. They have one thing certain to contend against, and that is the crank inventors who are infesting the country and are always put on the job shop patternmaker. They never know what they want and invariably use the brains of the patternmaker to get up something to please them.

A patternmaker ought to have a nice warm and comfortable place to work, plenty of light, a good stove in winter or a steam heat-

er to warm his stuff for the glueing, a good stock of well-seasoned lumber, scroll saw, band saw, combination saw table, bench trimmers, and in fact he should have anything necessary to facilitate his business.

But they are invariably stuck off in some dark corner. A great many small shops do not treat their patternmaker as well as he should be. He is expected to know everything, and how can he at times? He should be furnished with all the cuts of new machines, tools, etc., which are thrown in the waste basket. He should have access to text-books and be kept up with the times by his employer as the business requires, all designs to be of the latest and best styles possible, and there being no draughtsman he has to do all the thinking and is sometimes at a loss for a design to put into something he is making.

He is always employed. You very seldom hear of a tramp patternmaker, as he is the last man to be let go if he knows his and his employer's business.

And there is no man in the world who knows more about the all around business. He is asked all kinds of questions. Where is so and so? How long will it take to do so and so? And his value is never known fully until he dies or leaves and the boss finds it hard to fill his place, as he has to make all his own draughts, use his own judgment about sizes; and for the benefit of his employer and self he ought to be kept well posted on everything in the foundry line coming into use, as there is no end to all he is asked and expected to know.

My idea of the apprentice: He ought to be a bright and intelligent youth about 16 years old and be a gentleman, have a good mathematical education which will develop further in its applications to his business; he ought to write a nice hand, and ought never to have had to do work with tools before. He ought not to be a boy whose father has bought a tool chest for him at Christmas as he thinks he is a natural born mechanic. He should come into the shop free from having any tool knowledge, as they ought to be put into his hand the right way, and as they are placed there so he will continue to hold them. These amateur mechanics are always jacklegs; they don't know how to do anything and never come up to the mark.

His first year should be spent in the office and draughting room, as in the first he will be able to learn some of the official part, know prices, become familiar with names of everything, learn where they go, who makes the best and when they are applied.

With the draughtsman to assist him in making blue prints, tracing and going with him to measure up jobs and helping him in every way possible, and he should have access to the shops, such as taking up time, weighing up castings and acquiring a general knowledge of all he can in his first year, and by that time he won't be long before he becomes a useful young man and afterwards a credit to those who taught him.

Very respectfully, W. D. S.

Steel Castings.

Mr. Editor:

In looking over back files of The Foundry I was much interested in reading Mr. Pettigrew's able papers on steel molding, and thinking that a few remarks might lead to some more from the same writer or others, I'll remark them. This is not intended for a criticism, but merely in order to have something to say. In making the small car wheel he speaks of in his second paper, I thought perhaps if he placed 4 or 5 brackets or fins in the bottom of the wheel, about ¼ or ⅜ of an inch thick, running from the hub over the web to the rim, and nearly as deep as the same, would it not have saved it? Of course not seeing the pattern, a person would not be able to tell much about makink it. Have made hundreds of car wheels about the same size as he describes, and not very well proportioned, either, and saved them in that manner. Of course Mr. P. tells of how he did them. I would like to know if he does them the same way now. The wheels he speaks of in the same paper as splitting between every two arms, we would just split in the cener of the hub. A few weeks ago the foreman gave me a light wheel about 30 inches diameter, 6 inches face, and very light, with a remark that I had better split it. After looking over the pattern I told him I though we could cast it solid, that is, without splitting, so he looked at it and said try it. I just threw the sand in the teeth, tucked the sand in the arms and rammed the drag lightly, made parting and placed about a 4 inch round block or sinking head, as we call them, between each arm, set some light gaggers, ¼ inch iron about 2½ inches

bent on the end, rammed the cope just enough to carry, drew my pattern, cut about ¼ inch bracket on each side of the arms, dug out all sand between the arms but about an inch, and after it was cast poured some water down the hole in the cope, loosened the sand around the head and the wheel was good. It may have been luck. The water helped to soften the sand. I must say that this was poured down the head, as I claim that pouring light wheels with a gate on the bottom has a tendency to crack them. Of course the molder must use his judgment on what is the best way to pour his work. Have seen wheels that were a source of trouble for years, that were poured with a bottom gate, simply because the foreman was opposed to pour down the head. Some of them would crack, others would be all right. He was away on a vacation and I suggested to the molder that was making them to pour one down the head. He tried it. It was good; a second, so was it; a third, same result, and before the foreman came back there was about 40 made, no cracks. "He sawed wood." They are made that way yet. If castings that are poured from the bottom show blow holes, where will they show at if poured from the top? Some one will say, all over. Never. Have seen two castings from same pattern cast in one heat, one poured from above and the other from below, and both showed blow holes; again seen two castings of same pattern, one poured from the top, it was good; one poured from below showed blow holes. Have made pinions and rolls all the way from 5,000 to 35,000 pounds, poured them down the head and got good castings. Of course you must have good sand, the best obtainable. I have in my mind's eye a certain shop where if the facing sand was not handy the molders would use heap sand. If the steel drops 18 or 24 inches the sand scabs; nice way, is it not? But I see that I am taking too much space, the same as all others who send their first letter to any paper. In conclusion would like to ask the steel foundry men when do you think you will be able to cast top wobblers on rolls? I think that it can be dne now on some rolls. Can it not?

"MUD POUNDER."

The Union Foundry and Machine Co., Pittsburg, Pa., who have been making a specialty recently of their new "Union Tooth" where severe service is required of large gears, report the sale of a number of their gears to such well-known concerns as the National Tube Works, McKeesport, Pa.; Mann Edge Tool Co., Lewiston, Pa.; Pennsylvania Salt Works, Pittsburg, Pa.; Cleveland City Forge Co., Cleveland, O.; Grand Trunk Railway Co., Montreal, Canada; La Belle Iron Works, Wheeling, Va.

Books, Exchanges, Catalogues, Etc.

The Vacumm Oil Ci., Rochester, N. Y., send us a very neat office thermometer which will be found useful. They also send us a book of 50 pages on the subject of lubricating oils that contains a lot of very valuable information told in a most interesting way.

S. H. Brand & Co., of Chicago, who not only sell, but manufacture a very large line of foundry tools in the shape of riddles, brushes and bellows, are sending to the trade some very neat circulars describing their specialties.

The B. F. Sturtevant Co., of Boston, are sending out a neat circular illustrating the adaptability of their pressure blowers, blast gates, etc., for cupola purposes. They also show various styles ot exhaust fans for conveying dust from emery wheels, tumbling barrels, etc., as well as their heating and ventilating apparatus for heating in winter and ventilating in summer.

The P. H. & F. M. Roots Co., Connorsville, Ind., are sending out a very handsome catalogue, magnificently illustrated, printed in colors and on heavy coated paper. Among many other items of interest we notice a most comprehensive table giving sizes of blowers required to melt any given quantity of iron in cupola of proper size, and also of cubic feet of air discharged by any sized blower under varying conditions.

The complete novel in the April issue of Lippincott's is "Alain of Halfdene," by Anna Robeson Brown. It is a stirring tale of the sea, pirates, rescuers, and Mt. Desert (then by no means so well known as now), in the days when Washington was President.

Miss Molly Elliot Seawell has a sketch of "Paul Jones," in the Century for April. She quotes a portion of Jones' own account of

the battle between the Bon Homme Richard and the Serapis:

"I directed the fire of one of thre three Cannon Sgainst the mainmast With double headed Shot While the other two Were exceedingly well served with grape and Cannister shot to Silence the Enemie's musquetry and clear her Decks which was at last effected. the Enemy Were, as I have since understood, on the instant Calling for quarter. When the cowardise or treachery of three of my under officers induced them to call to the Enemy, the English Commodore asked me if I demanded quarter, and I having answered him in the most determined negative, they renewed the battle with redoubled fury."

What Paul Jones calls a "most determined negative" was the celebrated answer that will ever mark him as one of the bravest of the brave. The two ships lying head and stern, enveloped in smoke as they repeatedly caught fire from each other, and neither one in position to fire an effective shot, a sudden and awful silence ensued. Presently a call came from the Serapis: "Have you struck?" to which Paul Jones answered, "I have not yet begun to fight!"

Dr. Parkhurst's first article to women in The Ladies' Home Journal has proved so popular that the entire huge edition of the February issue of the magazine was exhausted within ten days, and a second edition of 45,000 copies has been printed.

The Review of Reviews for April declares that our American postal service fails to hold its own with European services, and that the chief cause of this failure lies in the inability of our Government to command a high quality of permanent expert managerial ability. Civil service reform cannot be advanced too rapidly in that department, says the Review.

Sessions Foundry Company, iron founders, of Bristol, Ct., have purchased a 26-acre tract of land at the north end of the town and expect to build a large complete new works for the manufacture of gray iron castings. This tract has a frontage of 900 feet on the railroad. There will be five or six spur tracks running into the different departments for receiving and shipping. They expect to keep a small locomotive of their own for handling cars in their yard. The main foundry building is to be 500x110 feet, shipping building 300x70 feet, pattern shop 60x80 feet, two stories; pattern storage building 50x100 feet, two stories; a large power house and an office. All of the buildings are to be of brick except the office, which is to be of granite. The main buildings are to be built with steel trusses and plank roofing covered with slate. There will be about 40,000 yards of grading; an iron and fuel stock yard ten feet higher than the foundry floor, with a retaining wall about 400 feet long on the back and the same on the front. The blowers and other machinery are to be run with electrical power. The heating of all these buildings is to be done by steam with the blowing system. There will be a large amount of skylights, and the works will be lighted by an electric plant. The plans are now being made by Davis & Barnes, of Philadelphia, who have been till recently with the Pencoyd Iron Works. The plans will be completed within a short time.

The S. Obermayer Co., of Cincinnati and Chicago have just received a cargo of East India plumbago direct from Colombo, Ceylon, which is probably the largest shipment of fine high-grade silver, lead or graphite ever imported. It required fifty cars to carry it from the port of entry to its destination, at the factories of this enterprising corporation. All judges of plumbago pronounce it to be the brightest and best they ever brought to this country.

Toledo, O., March 23, 1895.

Foundry Co., Detroit, Mich.:

Please to find enclosed $2, for which continue to send THE FOUNDRY for two years. Consider it money well spent, and wish you much success.

Recpectfully,
GEO. S. WAITE,
Toledo Manual Training School.

Millheim, Pa., Jan. 15th, 1895.

Inclosed you will find check for $1.00 for subscription for THE FOUNDRY. We could not, or would not, like to be without it, as there is much information in it every month.

We are, Yours truly,
J. H. B. HARTMAN & CO.,
Millheim, Pa.

Tyler, Texas, Jan. 15, 1895.

Foundry Publishing Co., Detroit, Mich.:

Dear Sirs—We inclose you herein our check for $1.00 to cover our subscription for the year 1895. We are very much pleased with your paper and wish you all success.

Yours truly,
TYLER FOUNDRY & MACHINERY CO.,
Tyler, Texas.

The Plumbago Club.

Owing to the fact that the President was delayed somewhat in reaching Cincinnati the club was a little late in being called to order. The members present, however, amused themselves in telling stories—true ones, of course—about last month's business, number of orders received and number refused owing to inability to get them out on time.

Mr. Griffith, as usual, was silent, looked wise, and occasionaly smiled at some of the unusually strong statements made by those present.

At last, however, apparently unable to control himself any longer, he interrupted Mr. Frohman—who was vainly trying to calm Mr. Hill's excitement at something Mr. Smith had said—with the remark: "It seems to me that all this argument simply resolves into the question as to can tell the tallest yarn. I suggest that, in order that the matter may be definitely settled, Mr. Smith and Mr. Hill each be permitted to tell a story or make a statement concerning either the volume of business done by their respective houses, the value of any or all of their goods, or in fact anything that would go to prove general excellence or progressiveness."

This seemed to meet with approval, and was about to be put into execution when the door was seen to quietly and cautiously open, and in a moment, armed with grip and umbrella, their President was in their midst. After being cordially welcomed and given a seat by the stove, where he sat warming himself with the air of a man who had traveled far and sacrificed much to be present, Mr. Griffith explained that there had been some little argument and controversy before he arrived between a couple of the gentlemen present, and to settle the matter a statement on the basis spoken of had been arranged for by each. Mr. Frohman suggested that the man whose story seemed the weakest should pay for a box of cigars, and hinted that they be ordered immediately. This the contestants both eagerly agreed to, each seeming to think that he would certainly have the advantage of his competitor. Mr. Frohman lost no time in giving the order, taking care to specify his own particular brand.

The President agreed to decide who was the victor, or rather who was the loser, as it was the latter who was to pay the penalty of being too confident without anything to back it. Mr. Hill said, as he gazed about the room in a half-contemptuous, sneering way, that indicated only too plainly how easily he expected to finish his rival, that he had for a long time been dissatisfied with the lack of improvement noticeable in the business of manufacturing foundry facings, and while this was especially true among other houses more than the one he represented, yet it seemed bad enough in any event compared with the achievements of this electrical age. He had been led to wonder if it would not be possible to make a facing that would be entirely incombustible and would positively prevent all action of the iron burning the sand. He had noticed how glazed bricks stood great heat; he had noticed many of his lady friends wear a sort of enamel at times that seemed indestructible (unless he let his beard grow for ten days), melted iron poured into molds coated with different preparations did not adhere, and as a result he had commenced a series of costly experiments a long time since that had resulted so successfully as to enable him to make the announcement that the S. Obermayer Company would on the 31st of April next place on the market a preparation that would entirely revolutionize this whole business and in all probability drive every other competitor out of it.

This statement, startling as it undoubtedly was, did not cause any uneasiness. Mr. Smith turned a little pale, the President seemed to wear a set, determined look on his face, while a little gleam showing out of his eyes indicated his thinking apparatus was in good working order, and that he began to suspect Mr. Hill had fallen into his usual habit of trying to eclipse the reputation so well deserved by the versatile Mr. Joseph Mulhatton. Mr. Griffith wore an anxious look as if he did not know what to expect next, while Mr. Frohman seemed quite happy, as he pictured to himself the time when the foundrymen of America would be clamoring for this wonderful article.

Mr. Hill, continuing, said they had all heard of the "one-bag facing" a certain concern was going to place on the market a few years ago, and how it fizzled out, and they might think this would do the same; but they would be disappointed, as it had been carefully tested by a great many leading

foundrymen on all kinds of work, among them being Dwight Truesdale, foreman of William Resor & Co., Cincinnati; P. J. McNamara, of McNamara & Koster, Indianapolis; Charles Thomas, superintendent of the Bagley & Sewall Co., Watertown, N. Y., and John Sadlier, of the Springfield Foundry Co., Springfield, O., and they had all declared it to be more extraordinary than the phonograph and make a casting as smooth as one of Gobeille's patterns. It consisted of a mixture shaken lightly through an ordinary blacking bag, followed by another shaken a few moments after from another bag. The contents of the first bag coming into contact with the damp sand formed a sort of cement, which united with the contents of the second bag and formed a perfectly glassy surface that hardened in a very few minutes, and if left for an hour would without any other attention become so hard that a stiff blow was required to break through the shell formed.

The mixture possessed the peculiar quality of resisting completely the action of the iron. A stove door made with it had a beautiful surface when shaken out, while heavy engine work resembled the blue steel appearance admired so much on gun barrels.

They intended to call it Obermayer's Patent, Insoluble, Incombustible, Adamantine, Salamander Mold Enamel, and as soon as it was introduced he expected other facing manufacturers to shut up shop and either go farming or move to South America.

As Mr. Hill concluded and reached for the cigars (he took three, as he expected the other gentleman to pay for them) a complacent smile overspread his features and all eyes were fixed on Mr. Smith. Beyond giving his moustache a slight stroke, however, he did not seem disconcerted. Mr. Frohman asked him if he had anything more wonderful than Mr. Hill's story to offer, or if he would pay for the cigars as it stood and call it square. Although all seemed to expect that was what he would do, he surprised them by saying that he had no fabulous yarns to tell of what was going to happen in "The Sweet Bye and Bye," but his company was making and selling every day a facing possessing more wonderful virtues than the mythical product with the long name referred to by Mr. Hill.

He said it had been discovered by those who constantly used Radiant Facings that the sand became in a degree inoculated with the astonishing virtues possessed by those goods, and that this talismanic effect in the course of a little time imparted itself to molders, foremen, and in fact everything about the shop, and a degree of excellence became discernible in everything done, that was the admiration of customers and the envy of competitors. When this material was used on the molds the castings were stronger, tougher and cleaner than was possible by any other process; absolutely free from imperfections of all kinds.

Besides that, molders became imbued with the desire to do more and better work, and the effect was beneficial all around.

Recently, however, one large concern was tempted to buy for trial some facings of another manufacturer, and in order to compare results one of the molders marked with chalk the word "Radiant" on the flasks containing molds using that brand. Through an error he marked a number of flasks containing grate bars and sash weights, and it was found upon shaking out that they were among the smoothest castings in the entire heat. Acting on this discovery the foreman made some exhaustive tests, and found that the mere writing of the word "Radiant" on the outside of the flask, or stamping it on the mold, was all that was necessary; and further discovered that the pasting of a printed label on the outside of each flask would result in a better casting than the use of unlimited quantities of inferior goods made by other dealers.

The scene that followed this recital was a "lively" one. Mr. Hill had fainted and it seemed as if the united efforts of all present were insufficient to revive him; but he came around quickly enough when the President held an empty Bourbon bottle under his nose, and was able to take part in the proceedings when the President called the club to order a few moments later. Beyond signifying his desire to settle for the box of cigars, he had nothing to say.

The Secretary reported that he has been overwhelmed with correspondence from from foundry supply men asking for particulars concerning the Club, and as he was very busy asked for permission to secure the services of a lady assistant. This, as might have been expected, provoked considerable debate, the details of which it is unnecessary to repeat here, but it was finally decided to

leave the matter in the hands of a committee consisting of Vice-President Smith and Treasurer Griffiths. The Secretary further reported the receipt of application for membership from George P. Millns, president and manager of the Cleveland Facing Mills Company, Cleveland, O., and the other from Mr. G. S. Bullock, with Whitehead Brothers Company, Providence, R. I. Mr. Smith moved and Mr. Griffith seconded a motion that both gentlemen be admitted to membership. Mr. Hill, who had in the meantime recovered and seemed quite himself again, took the floor at this stage and, addressing the chair, said that he had taken a prominent part in the formation of this Club and he wanted to know all about those who were admitted to membership. Mr. Bullock he had heard much of and believed that he was a gentleman who would reflect credit on anything he was affiliated with. It had been said that he had lots of friends in the New England States who would never deal with anyone else, and that the longer they knew him the better they liked him. Besides that, he was connected with an A1 concern, the foundations of whose business were laid in the early part of this century, and who deserved the name of being perhaps the largest dealers in molding sand on this earth or any other earth; but when it came to Mr. Millns he wanted more particulars. Mr. Millns was not a molder like Mr. Hill claimed to be, neither was he a globe-trotter like some of those present; on the contrary, he was one of those who stay at home and write letters to the trade and get out pretty little circulars and testimonials that would catch the eye of the foundryman. He did not know what it was to keep pounding about the country with the sole purpose of keeping foundrymen posted concerning the best place to buy goods, and for his part he wanted the Club to be a little careful.

Mr. Smith got up to reply and commenced by addressing Mr. Hill, but was promptly called to order by the President, who insisted on Mr. Smith addressing the chair. Mr. Smith was excited and evidently had a difficult task to control himself. He said it was an outrage to try to keep Mr. Millns out of the Club just because he was one of the rising young men of the business; he had known Mr. Millns a long time and known of him far longer. He had been engaged in the business of making foundry facings for at least twenty years, and he did not believe Mr. Hill had anything like as much experience himself. Moreover, he had given to the world the C. F. M. Perfect Wash, an article that a good many people tried to imitate, and which was considered by some foundrymen indispensible to the production of good castings. He urged the need of a liberal spirit in these matters and hoped that Mr. Millns would not only be elected unanimously, but given a hearty welcome.

Mr. Hill withdrew his objection and the original motion was carried without a dissenting voice.

The Secretary announced that both gentlemen were waiting, and a committee consisting of Messrs. Hill and Smith was appointed to conduct them in, which they did. The President on behalf of those present gave them a cordial welcome, to which both responded in a happy manner.

A committee to draft by-laws for the government of the Club, consisting of Messrs. Millns, Frohman and Griffith, was appointed by the President. Mr. Frohman suggested that it would be a good plan to appoint a committee to select a place for permanent headquarters, and all agreeing the President appointed Messrs. Frohman, Bullock and himself, as he said he wanted to see fair play on that important subject.

After listening to an interesting address by the President on the state of trade in various parts of the country recently visited by him, the Club adjourned to meet promptly at 7 p. m. the last Saturday in March, meeting place to be provided by the Secretary in the meantime.

Rogers, Brown & Co., Cincinnati, are sending out a neatly printed and fold card containing the following:

Study closely the following table, corrected personally for us by James M. Swank, and note:

1. That production, in the grand aggregate, doubles every ten years.

2. That in each decade there is usually a period of about five years in which it declines, or remains practically stationary.

3. That in the succeeding five years it usually leaps forward, till the grand average of 10 per cent annual increase is attained.

4. We are in the fifth year of decline from the maximum output of 1890.

QUERIES.

Have we reached the end of the 10 per cent per annum gain maintained for forty years?

Are we near the turn, and heavy increase, which have in the past followed four or five years of decline?

FORTY YEARS' PIG IRON PRODUCTION OF THE UNITED STATES.

Year.	Net Tons.	Year.	Net Tons.
1854.....	736,218	1874.....	2,689,413
1855.....	784,178	1875.....	2,266,581
1856.....	883,137	1876.....	2,093,236
1857.....	798,157	1877.....	2,314,585
1858.....	705,094	1878.....	2,577,361
1859.....	840,627	1879.....	3,070,875
1860.....	919,770	1880.....	4,295,414
1861.....	731,544	1881.....	4,641,564
1862.....	787,662	1882.....	5,178,122
183.....	947,604	1883.....	5,146,972
1864.....1,135,996		1884.....	4,589,613
1865.....	931,582	1885.....	4,529,869
1866.....1,350,343		1886.....	6,365,328
1867.....1,461,626		1887.....	7,187,206
1868.....1,603,000		1888.....	7,268,507
1869.....1,916,441		1889.....	8,516,079
1870.....1,865,000		1890.....10,307,028	
1871.....1,911,608		1891.....	9,273,455
1872.....2,854,558		1892.....10,255,840	
1873.....2,868,278		1893.....	7,979,442
		1894.....	7,456,274

Gross tons, 194, 6,657,388.

Farrar, Trefts & Rood, Buffalo, N. Y., manufacturers of iron castings for locomotives and rolling stock for railroads, have asked for a receiver.

Timothy B. Hussey will rebuild his foundry at North Berwick, Pa., recently destroyed by fire at a loss of $50,000.

The foundry of Chagrin Falls Mnfg Co. has started up under management of W. M. Powell.

Please send us THE FOUNDRY for one year; we find it very handy for reference.

SCHULTZ & BRYANT,
Carterville, Mo.

The great bulk of the hat manufacturing machinery of this country is manufactured by the Turner Machine Co., of Danbury, Conn., a branch of the well-known concern operating at Denton, England.

The American establishment referred to has recently completed a number of extensive improvements, an addition to the machine shop being four stories—30x60 feet; also new offices and store room. The addition to the foundry is 45x100 feet, and will be thoroughly refitted throughout with every modern improvement.

Please find enclosed P. O. Order for $1.00, my subscription to THE FOUNDRY for the coming year.

I can say that I have been more than pleased with it the last year, and I shall never be without it again.

S. C. BANCHUR,
Foundry Foreman Durango Iron Works, Durango, Col.

Testing Emery Wheels.

The Bridgeport, Ct., Morning Union, of ercent date, has this in reference to the testing of emery wheels by the Springfield Manufacturing Company, of that city:

The Morning Union reporter happening to pass the factory of the Springfield Manufacturing Co., dropped in and finding preparations in progress for the testing of a new emery wheel, was impelled by curiosity to stay. The wheels to be tested were an invention of Mr. Jackman, who for a long time has been working on an emery wheel which would to some extent prevent the loss of life which comes from the bursting of the ordinary wheel. The wheels were tested, the first without the safety device, the second with it. The first wheel was adjusted and the steam turned on, at first moving with slow speed, but rapidly increasing to the tremendous speed of 4,080 revolutions a minute. The wheel was 14 inches in diameter by two inches in thickness, with a speed of 1,600 revolutions a minute.

In most factories the wheels are tested at one and one-half times their given speed; here they are tested at twice that. The wheel tested was run to two and a half times its guarantee before bursting. The safety bond wheel was then put on and allowed to attain the speed of 3,780 revolutions a minute. At this, if the wheel were capable of moving straight ahead, it would move over the ground at the speed of three miles a minute. After running for some time it was taken off, cracked nearly in two, and put back again and with gradually increasing speed reached 3,240 revolutions a minute before it separated. This was a very convincing test of the merits of the wheel. It is by far the best of the many safety wheels on the market. The use of it cannot but reduce the list of casualties caused by the breaking of the wheels while in use.

The Gobeille Pattern Co.'s Latest.

As one thought often suggests another and several combined are apt to suggest a conclusion, we always feel, whenever noticing any of the atistic advertising matter of the Gobeille Pattern Co., that the secret of the really wonderful success of that large concern should be readily understood. Certainly if their designs are as original and their patterns as neatly constructed as the occasional reminders they send their friends, their success is deserved.

The latest evidence of this we have seen is a reproduction of the familiar Western Union Telegraph blank, the top of which contains a few plain statements concerning

Form No. 101.

THE GOBEILLE PATTERN COMPANY.

INCORPORATED

1,200 CUSTOMERS IN AMERICA. LARGEST PATTERN WORKS IN THE WORLD.

This Company **DESIGNS** and **MANUFACTURES** patterns much better, cheaper and quicker than any other concern, which statement we can make good. The founder of this Company is a practical man who has never been in any other business, he not only superintends, but gives his entire time to the business, when at home, in consultation with heads of departments or foremen, and watching the details of work in process, and when away from home he has exceptional opportunities for studying all the phases of foundry practice.

This is a **REPEATED MESSAGE** and is a confirmation of a telegraphic communication which was sent prepaid as below.

GEO. W. KOHLMETZ, Secretary and Ass't Manager.

NUMBER	SENT BY	RECD BY	CHECK
157	J L K		12 Paid

SENT FROM CLEVELAND, O. 9a M. Standard Time. 3/25 1895

By the Western Union

To Daniel Ashworth

Telegram received Send on the drawings. Can put one hundred pattern makers on job if necessary.

The Gobeille Pattern Co

Form No. 168.

THE WESTERN UNION TELEGRAPH COMPANY.

INCORPORATED

21,000 OFFICES IN AMERICA. CABLE SERVICE TO ALL THE WORLD.

This Company **TRANSMITS** and **DELIVERS** messages only on conditions limiting its liability, which have been assented to by the sender of the following message.

Errors can be guarded against only by repeating a message back to the sending station for comparison, and the Company will not hold itself liable for errors or delays in transmission or delivery of **Unrepeated Messages**, beyond the amount of tolls paid thereon, nor in any case where the claim is not presented in writing within sixty days after the message is filed with the Company for transmission.

This is an **UNREPEATED MESSAGE**, and is delivered by request of the sender, under the conditions named above.

THOS. T. ECKERT, President and General Manager.

RECEIVED at CLEVELAND, O. Standard Time.

3 H SX Z 20 Paid 9 15 A.

Pittsburg Pa .25 Mar. 25 1895.

The Gobeille Pattern Co.

Prints leave today twenty five car loads train three sections all other trains side tracked secure a Thousand pattern makers.

D. Ashworth.

the Gobeille Company instead of the Western Union, and on this is written the telegram as shown in the following cut, and then mailed in an envelope to correspond.

The wording of the "telegram" is especially intended to impress the reader with the company's capacity. As will be noticed by the reply, one of the recipients, Mr. D. Ashworth, of Pittsburg, saw the joke, "and if anything, went the Gobeille company one better.

We have managed to secure copies of both telegrams, and have thought the matter both interesting and amusing enough to reproduce in these columns.

Pittsburg and Vicinity.

Manufauturers of all kinds of material express the opinion that there is more business now being done than there has been for months past, and they feel assured that it is but the opening up of a large amount of projected work, which has been delayed for a long time.

The outcome in the advance of wages in the coke regions has given rise to more discussion than any other event for a year. While there seems to be no other way than to advance prices for the products into which coke enters, it is thought by some that such a conclusion may be avoided. The smaller members of the iron trade feel alarmed, and for the present do not see a clear way out, but the fog may clear away presently, and all will be smooth sailing.

The crude iron market shows unmistakable signs of improvement in all directions, while as regards finished material, there is a more satisfactory movement east and west. The builders of heavy machinery also report an improvement, but it is a little weaker than in other lines. The best feature of the market is seen in structural material, and it is firmly believed that the coming season will be an exceptionally lively one.

It cannot be denied that the signs of a coming improvement are more numerous, and things are evidently shaping themselves for this movement. Altogether the iron trade is gaining strength, but it is the slow gain of a patient that has been sick a long time.

We herewith quote the range of prices at Pittsburg on April 1st:

No. 1 foundry	$10.50@10.75 cash
No. 2 foundry	9.75@10.00 cash
Charcoal foundry No. 1	16.50@17.00 cash
Charcoal foundry No. 2	15.50@16.00 cash

ROLLING MILL CASTINGS.

	Cents per lb.
Chilled rolls, up to 12" diameter	3¾
Chilled rolls, over 12" diameter	3¼
Sand and Homogeneous steel rolls and pinions up to 12" diameter	2¾
Over 12" diameter	2¼
V-tooth pinions, additional	¼c
Housen and rolling mill castings not otherwise specified	2
Spindles and coupling boxes	1¾
Squeezer castings	2
Squeezer pinions and wheels	2¼
Spur and bevel wheels, large	2½
Spur and bevel wheels, small	3 to 4

The Pierce-Crouch Engine Co., of New Brighton, will erect a foundry plant for turning out castings for its gas engines.

The Arsenal Foundry Company, Ltd., manufacturers of grate bars, boiler fronts and general castings, has its plant running to nearly full capacity.

The A. Garrison Foundry Co., of the South Side, has a large force of men working on a number of orders, particularly for several cold rolling mills, for Pennsylvania parties.

M. A. Cutter, of this city, together with several other well-known capitalists, have organized the American Malleable Iron Co., and will locate a plant at Latrobe, Pa.

The Kelly & Jones Company, of this city, are contemplating the erection of a brass foundry at Greensburg. An addition to the plant has just been finished, which will be used for the manufacture of iron valves.

The Leechburg Foundry & Machine Company's plant at Leechburg, is kept busily engaged on rolling mill and tin mill machinery of all kinds. Orders have recently been received from the Los Angeles (Cal.) Iron & Steel Co., Crescent Sheet & Tin Plate Co., of Cleveland, and the La Belle Iron Works, of Wheeling, W. Va.

The Frank-Kneeland Machine Co. has received a contract from the American Steel Foundry Co., of Granite City, Ill., to furnish hydraulic cranes, lifts, accumulator shear tables, pit covers, etc. Shipments of tin mill machinery have been made to the Pennsylvania Tin Plate Co., New Kensington, Pa., National Tin Plate Co., Anderson, Ind., and the Crescent Sheet & Tin Plate Co., of Cleveland, O.